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(54) **METHODS FOR COUNTERACTING REBOUNDING EFFECTS DURING SOLID STATE RESISTANCE WELDING OF DISSIMILAR MATERIALS**

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(57) **ABSTRACT**

The present disclosure is directed to methods for joining initially separate members of different metallic materials, e.g., as in joining segments of a multi-segment intravascular guide wire, as well as multi-segment intravascular guide wires so formed. Initially separate members are provided, which members comprise different metallic materials relative to one another (e.g., stainless steel and nitinol). The members are aligned with one another, and a first force is applied to the members while delivering electrical current through the members to solid state weld the separate members to one another. A follow up force that is greater than the first force is applied as solid-state deformation occurs and a weld nugget forms between the members. The weld nugget so formed is thinner and of a larger transverse cross-sectional area than would be produced without application of the follow up force.

23 Claims, 19 Drawing Sheets